

EXHIBIT 14



OXFORD JOURNALS
OXFORD UNIVERSITY PRESS

Second-Sourcing as a Commitment: Monopoly Incentives to Attract Competition

Author(s): Joseph Farrell and Nancy T. Gallini

Source: *The Quarterly Journal of Economics*, Nov., 1988, Vol. 103, No. 4 (Nov., 1988), pp. 673-694

Published by: Oxford University Press

Stable URL: <https://www.jstor.org/stable/1886069>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



Oxford University Press is collaborating with JSTOR to digitize, preserve and extend access to *The Quarterly Journal of Economics*

Exhibit #

Farrell 111

03/15/24 - MC

exhibitstickr.com

SECOND-SOURCING AS A COMMITMENT: MONOPOLY INCENTIVES TO ATTRACT COMPETITION*

JOSEPH FARRELL AND NANCY T. GALLINI

We show that a new product monopolist may benefit from (delayed) competition if consumers incur setup costs. Setup costs create a dynamic consistency problem: the monopolist cannot guarantee low future prices once customers have incurred those costs. We show that, if customers anticipate this problem, the monopolist's profits can be improved through ex ante commitment to competition in the post-adoption market, if setup costs are large. If setup costs are small, the monopolist can typically achieve the same level of profits without price commitment as with.

I. INTRODUCTION

In many markets, buyers must bear specific setup costs in order to use a product. This can create a problem of *opportunism*: the seller can expropriate the returns to the buyer's specific investment by raising the price ex post. A recent literature¹ on "switching costs" has analyzed this problem when there are competing sellers and each firm's product has its own setup cost, and shows how opportunism leads to price or quality "gouging" once buyers have made seller-specific investments. In this paper we analyze how the prospect of similar opportunism affects a *monopolistic* seller.

Buyers of a new product may be reluctant to incur setup costs if they will be exploited ex post. This reduces their willingness to pay, to the detriment of sellers; consequently, a monopolistic seller might benefit from an ability to commit to low future prices. We confirm, in a simple model, that a monopolist would often *strictly* value that ability.

As recent literature in industrial organization has repeatedly shown, firms will often value an ability to commit; perhaps a more interesting question is *how* to commit to actions that may be unprofitable ex post. One way to commit not to gouge buyers ex post is *second-sourcing*: voluntarily inviting competitors into the

*We are grateful to Mukesh Eswaran, Ashok Kotwal, Maria Maher, Paul Milgrom, Pierre Regibeau, Kate Rockett, Ralph Winter, two anonymous referees, and seminar participants at Berkeley, Stanford, and Cal Tech for their comments and suggestions.

Farrell's research was supported by the National Science Foundation (grant IST-87-12238), and Gallini's by the Social Science and Humanities Research Council of Canada and the Olin Foundation.

1. See, for instance, von Weizsacker [1984], Klemperer [1987a,b], Green and Scotchmer [1986], and Farrell and Shapiro [1987,1988].

We limit introductory offers by assuming that prices must be nonnegative. (At a negative price, people could take computers at a negative price and use them for landfill. Similarly, as in Farrell and Shapiro [1987], if F differs between consumers, then introductory prices cannot be too low.) This limits the seller's ability to use intertemporal pricing flexibility to pay the setup cost himself, and (as we shall see) that creates a problem of opportunism.

If $F > v$, so that a first-period price of $v - F$ would be negative and therefore inadmissible, then there is a dynamic consistency problem. Buyers will never buy in period 1 at any nonnegative price without a second-period price commitment, since to do so would give them negative surplus in the first period and they know that they would get nothing in the second. Therefore, the seller who cannot commit to a second-period price makes no sales! Consequently, the seller will seek to commit to future prices. Given the imperfections of long-term price contracts, second-sourcing may be a desirable commitment strategy.

In this model and its generalizations in Section III, we have the following immediate result:⁶

PROPOSITION 1. There exists a two-part licensing contract (a per unit royalty and a fixed fee) that extracts the whole social surplus.

If the monopolist has two instruments (per unit royalties and fixed fees) with which to achieve two targets: monopoly output and redistribution of profits, he can allow one or more licensee(s) to sell in *both* periods at a per unit royalty of $R = v - F/(1 + \delta) - c$. Since the price path $(R + c, R + c)$ satisfies (2) with equality and satisfies (3) and (4), the full social surplus becomes industry profits under price competition. The licensees make no profits; the original seller gets the whole surplus.

But such royalty payment schemes are often infeasible or costly to write or enforce. As a result, in many second-source agreements the developer simply gives away the technology.⁷ It

6. This result is analogous to Shepard [1987], who allows flexible licensing contracts involving royalties and fixed fees. In her paper the per unit royalty is used to achieve first-best quality, and the fixed fee is used to redistribute rents back to the licensor.

7. Empirical evidence shows that many licensing contracts specify royalty rates of only 3–5 percent of sales [Lovell, 1968]. Several explanations are given for low royalty rates. For example, the licensor may have to specify low royalty rates to prevent a licensee from imitating the licensed product. Inability to monitor output or product quality or a strong bargaining position of the licensee may also necessitate low royalty rates. (See Gallini [1984], Horstman and Markusen [1986], and Teece [1986].)

might seem that such a commitment to perfectly competitive pricing (even with a lag) is going too far, from the point of view of the profit-maximizing monopolist. We shall see below that this can be true when demand is elastic, but in our benchmark model, second-sourcing without royalties always achieves first-best profits when commitment is needed; i.e., when $F > v$. To see this, note that since the second-period price is just $p_2 = c$, a first-period price $p_1 = v(1 + \delta) - F - \delta c$ satisfies (2) with equality. As Figure II shows, when $F > v$, any (nonnegative) price-path that satisfies (2) with equality automatically satisfies (3) and (4). Profits (which accrue entirely in period 1) are then $p_1 - c = (1 + \delta)(v - c) - F$ per buyer, which is the full social surplus.

For smaller F , second-sourcing without royalties need not be profitable. We have seen that, for $F < v$, it is unnecessary, since the seller can extract the full social surplus without it. If F is not too far below v , second-sourcing is neutral for profits: the seller extracts the whole surplus with or without it. But when $F < v - c$, second-sourcing strictly reduces profits. To see this, note that with $p_2 = c$, (4) is automatic. If (2) is the binding constraint on first-period price, then the seller can extract the full surplus; but since $F < v - c$, (3) is the binding constraint, and the seller can get no more than

$$p_1 - c = v - (1 - \delta)F - c,$$

which is less than the full surplus (1) since $F < v - c$.

PROPOSITION 2. For sufficiently large adoption costs, $F > v$, second-sourcing without royalties achieves first-best profits, while no profits are attainable without commitment. For lower setup costs, $F \leq v$, the seller can extract the full surplus without commitment. When $v - c \leq F \leq v$, second-sourcing is neutral for profits; when $F < v - c$, it strictly reduces profits.

This benchmark model illustrates two principal results: (1) price commitment matters when setup costs are large, and (2) second-sourcing can then be an effective form of price commitment. In the next section we show that these results continue to hold in somewhat more general models.

III. RELAXING THE ASSUMPTIONS

In this section we relax (separately) three assumptions of the benchmark model: identical customers, inelastic buyer demands,